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## New Type Willard Battery Cap\*

CORRECT SOLUTION LEVEL IMPORTANT — TOO HIGH IS AS BAD AS TOO LOW — WINTER CARE OF BATTERIES

By L. E. WELLS, Chief Engineer

Willard Storage Battery Company, Cleveland, Ohio

In this day of increased electrical loads, all-weather driving and batteries located under the hood, proper battery care is an important servicing problem.

Except for recharging when the battery is run down, proper filling is the most important battery servicing operation the station attendant has to perform. Too low an electrolyte level causes shortening of battery life. Overfilling, a much more common condition, causes acid spraying and surging. This can cause considerable damage, particularly where the battery is located under the hood, close to the car's vital parts.

Wiring, accelerator rods, manifold, dash, hood and other metal parts can be badly damaged through constant contact with this spray. The very least that spray will do is to corrode the battery terminals and cables, resulting in current losses and subsequent poor starting.

The Willard Company on their new Safety-Fill type battery have provided a means to make it easy for the service man to fill the battery to the correct level only.

It is a very simple matter to service this type of battery correctly. All that is neces-

sary is to unscrew the cap from the filler well and press it securely on the vent. Take hydrometer reading, return solution to the cell from which it was drawn, discarding any excess. Add water to cell if necessary, then replace cap.

### BATTERY CONDITION MORE IMPORTANT IN WINTER

A fully charged, healthy battery is of the utmost importance for trouble-free winter motoring. When the temperature drops, the engine is not only much harder to start, because of sluggish oil and slower vaporization of gasoline, but the battery itself becomes less efficient. The following table shows the effects of temperature on the battery.

Temperature	Proportion of Capacity Available	
	20 Hour Rate (Lighting Ability)	300 Amps. (Cranking Ability)
80° F. ....	100%	100%
60° F. ....	97%	91%
40° F. ....	92%	81%
20° F. ....	83%	72%
10° F. ....	74%	65%
0° F. ....	60%	58%

Specific gravity of the battery should be checked with an accurate hydrometer every month or 1,000 miles.

Leaks in sealing compound or around post gaskets, permit escape of electrolyte. This may result in corrosion of the engine or chassis parts. On battery installations under the hood, engine fan may spray electrolyte on engine parts. Use a seal tester to discover sealing leaks. Reseal if necessary. For testing batteries under the hood, use the new shorter type hydrometers recently brought out. Old types are too long.

### ENTIRE LOW VOLTAGE CIRCUIT IMPORTANT TO BATTERY LIFE

Maximum battery performance is available only when the generator, regulator, starting motor, cables and electrical accessories are in good condition and do not cause excessive current losses. No car is properly serviced for winter until all parts of the low voltage or battery circuit are tested and placed in a first-class condition. If any of the essential units in the low voltage circuit are faulty, the battery cannot be expected to deliver full power.

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## New Type Hood Locks

Hoods that are locked and unlocked from the driver's seat are standard equipment on Chevrolet, Hudson, Oldsmobile and Studebaker 1940 models. Undoubtedly, the generally adopted change in location of the battery from inconvenient locations on the

chassis frame to under the hood has been responsible for providing a means of locking the hood. It is interesting to note that this new feature was not found on cars until the battery took its place alongside of the engine. Batteries are expensive and therefore

car manufacturers are wisely providing protection against theft.

Manufacturers, in featuring the new battery location, are pointing out that the ease of access to the battery leads to more fre-

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# TIPS ON SERVICING THE 1940 CARS

## ALLIGATOR TYPE HOODS

**CADILLAC**—On V-8 models, tilt back radiator ornament. On V-16 safety catch must also be released.

**CHEVROLET**—Pull out knob under left side of instrument panel. Release catch at front of hood.

**CROSLEY**—Twist radiator ornament.

**FORD**—Pull out V-8 ornament.

**GRAHAM**—Turn radiator ornament clockwise. To lower, raise hood to release prop catch.

**HUPMOBILE**—Release catch at lower left louvre.

**LA SALLE**—Tilt back radiator ornament.

**LINCOLN ZEPHYR**—Twist front part of chrome trim on top of hood counter-clockwise.

**MERCURY**—Pull out V-8 ornament.

**NASH**—Twist handle at base of grille counter-clockwise.

**OLDSMOBILE**—Pull out control button on instrument panel. Insert fingers and release safety catch.

**PONTIAC**—Lift Indian head ornament.

**STUDEBAKER**—Push down lever in driver's compartment release safety catch at tip of hood.

**WILLYS**—Lift lock handle below hood front. Push back safety catch.

### WATER FILL PIPE LEFT SIDE UNDER HOOD

Bantam	Hupmobile
Cadillac	La Salle
Champion	Lincoln V-12
Chrysler	Mercury
De Soto	Oldsmobile
Dodge	Packard
Hudson	Plymouth

### OIL FILL PIPE ON LEFT SIDE

Bantam	La Salle
Cadillac	Lincoln V-12
Champion	Mercury*
Chrysler	Nash-Lafayette
De Soto	Oldsmobile
Dodge	Packard
Ford*	Plymouth
Graham	Pontiac
Hudson	Studebaker
Hupmobile	

\*Gauge Stick Location

### GASOLINE FILL PIPE AT LEFT

Bantam	Graham
(under hood)	Hudson
Buick (under trap door)	La Salle
Cadillac	Lincoln-Zephyr
Chrysler	Mercury
Crosley	Nash
(under hood)	Nash-Lafayette
De Soto	Oldsmobile
Dodge	Packard
Ford	Plymouth

Pontiac 26-28-29

### WATER FILL PIPE CENTER UNDER HOOD

Ford	Nash
Graham	Pontiac
Lincoln-Zephyr	Studebaker
	Willys

### WATER FILL PIPE ON RIGHT SIDE UNDER HOOD

Buick	Chevrolet
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### OIL FILL PIPE ON RIGHT SIDE

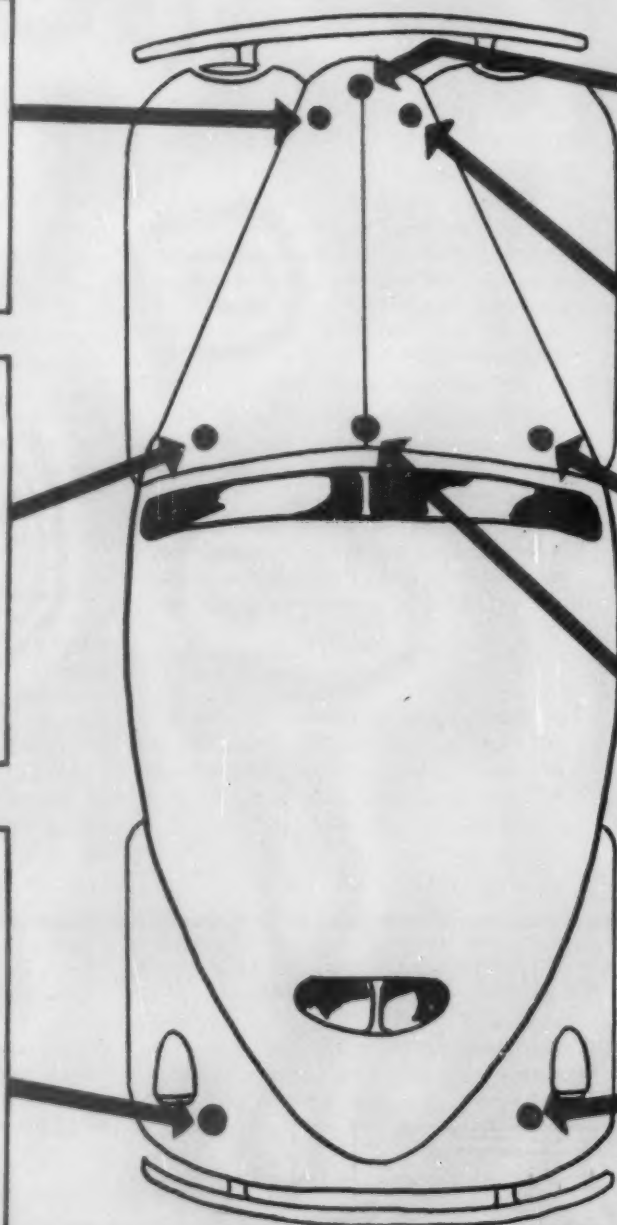
Buick	Chevrolet
	Willys

### OIL FILL PIPE IN CENTER

Crosley (under hood, at front)  
Ford  
Lincoln-Zephyr  
Mercury  
Nash Ambassador

### GASOLINE FILL PIPE AT RIGHT

Chevrolet	Pontiac (6 Rdstr.)
Hupmobile	Studebaker
Lincoln V-12	Willys



## SIDE LIFT TYPE HOODS

**AMERICAN BANTAM**—Levers inside car under cowl to release each side of hood.

**BUICK**—Latch is the part of the chrome side louvre containing name plate.

**CHRYSLER**—Front part of hood side louvres is hood latch. Pull trailing edges straight out.

**DE SOTO**—Front part of hood side louvres is hood latch. Pull trailing edges straight out.

**DODGE**—Twist latch on side panel.

**PACKARD**—Twist handle on side panel.

**PLYMOUTH**—Twist handle on side panel.

## REVERSE ALLIGATOR TYPE HOODS

**HUDSON**—Hood is locked by lever under instrument panel on left side. To open, push forward.



## The INSTITUTE SPOKESMAN

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LUBRICATING GREASE INSTITUTE

GEORGE W. MILLER . . . Editor  
498 Winspear Avenue, Buffalo, N. Y.

### Welcome Deep Rock Oil Corporation

We are pleased to announce that Deep Rock Oil Corporation has become an Associate Member of the Institute. "Bill" Murray, Asst. General Sales Manager, located in Chicago will represent Deep Rock.

(Continued from page 1)

quent hydrometer readings and checking of the liquid level, resulting in longer battery life.

A locked hood might at first seem to be an obstacle against getting under the hood to check crankcase oil. However, the ease with which hoods may be locked and unlocked from the driver's compartment removes that obstacle. Furthermore, the average car owner realizes the importance of frequent checking of crankcase oil in modern precision-built engines, and appreciates the fact that, in checking the level of the oil in the crankcase and the water in the cooling system, the service station attendant is doing him a real favor.

Since there are two general methods used to unlock hoods, a brief description of methods of gaining access to under hood points on 1940 cars may save station attendants some embarrassing moments.

#### CHEVROLET AND OLDSMOBILE

On the 1940 Chevrolet and Oldsmobile models the hood lock is released by pulling the knob just below the extreme left side of the instrument panel. When this release rod knob is pulled, the hood will open a small distance at the front end, but it cannot be raised until the safety catch has been released by inserting the fingers and freeing the secondary catch, which prevents the hood from being jarred open on the highway in case the dash knob is accidentally released.

#### STUDEBAKER AND HUDSON

The hood release on Studebaker and Hudson 1940 models is not of the push-pull rod design. An over-center toggle lever construction is used, and its operation is quite similar to opening and closing the cowl ventilator.

## Car Mfgrs. Latest Recommendations\*

#### NASH SHOCK ABSORBERS

The front shock absorbers on 1940 Nash models are equipped with plugs for refilling. The rear shock absorbers are sealed and cannot be refilled or adjusted, but must be referred to an authorized Nash dealer for replacement.

#### THE CHEVROLET HYPOID TRUCK AXLE

A completely illustrated story on servicing the hypoid rear axle of the Chevrolet 1½ ton truck appears in the January issue of AUTOMOTIVE SERVICE. Considerable interest has been aroused by this new unit, one of the few hypoids used on this size truck. For copies write Jack Weed, Editor, 2751 E. Jefferson, Detroit, Mich.

#### CHRYSLER LINE 7 PASSENGER MODELS HAVE THREE UNIVERSAL JOINTS

A very limited number of 7 passenger models have been built to order by Chrysler, De Soto, Dodge and Plymouth during the past four years. The total production of such models does not run over a few hundred each year. However, the 7 passenger models have a long wheel base and entail some changes in design of the propeller shaft, due to the greater length. Car instruction books do not carry this information.

CHRYSLER ROYAL 6, DE SOTO, DODGE AND PLYMOUTH—1937-38-39—On 7 passenger cars, these models have an additional ball and trunnion joint just to the rear of the propeller shaft center bearing.

CHRYSLER AND DE SOTO—1940—The Chrysler Royal 6 (C25) and the De Soto 6 (S7)—1940 models use the cross type of universal joint as standard equipment. A third cross type joint is used on 7 passenger models.

DODGE AND PLYMOUTH—1940—The Dodge 6 (D14) and the Plymouth P10—1940 models use the ball and trunnion type of universal joint as standard equipment. On 7 passenger models, these are replaced by cross type joints and a third cross type joint is used.

#### RUBBER SHACKLES FOR PLYMOUTH

Effective approximately January 20, Plymouth P9 and P10 models started coming

On Studebaker models, the hood opens at the front end and a secondary safety catch is used, which is operated in the same manner as on the Oldsmobile and Chevrolet models described above.

The hood on 1940 Hudson models is of the reverse alligator type. That is, it opens from the rear instead of from the front. After releasing the hood lock toggle lever, the hood is raised by placing the fingers un-

der the assembly line with all rubber shackles and mountings for the rear springs. This eliminates four lubrication points at the rear ends of the springs, the front ends having been rubber mounted from the beginning of production.

#### PACKARD DIFFERENTIAL CAPACITIES

##### RE-CHECKED

The Packard Motor Car Company has recently made some corrections in the amount of lubricant to be used in the rear axle differentials of its cars. In many instances, it was found that if the cases were filled too rapidly, or not enough time was allowed for the heavy lubricant to seek the proper level, air pockets were formed. This prevented the proper or maximum amount of lubricant being added. It is important that the differential case be completely filled to the level of the filled plug hole and that no air pockets are present to restrict adding the correct amount of lubricant. If this procedure is followed, better performance will be secured from the unit.

Following are the changes in Packard's recommended differential capacities.

Six - 1937—Changed from 5 pt. or lb. to 6¾ pt. or lb.

Six - 1938-39—Changed from 6 pt. or lb. to 6¾ pt. or lb.

110 (6) - 1940—Changed from 4½ pt. or lb. to 5 pt. or lb.

120 - 1937—Changed from 5 pt. or lb. to 6¾ pt. or lb.

120 (8) - 1938-39-40—Changed from 6 pt. or lb. to 6¾ pt. or lb.

Super 8 - 1939-40—Changed from 6 pt. or lb. to 6¾ pt. or lb.

#### WILLYS CHANGES TIE ROD CONSTRUCTION

Starting with car Serial No. 31482 on passenger cars and Serial No. 31594 on commercial cars, the Willys Overland Company has changed the construction at the ends of the tie rod, which were rubber mounted and required no lubrication on previous production. Tie rod ends are now being equipped with fittings through which Chassis Lubricant should be applied every 1,000 miles.

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der ledges provided on each side at the rear of the hood, then lifting upward and forward.

Hudson models are not provided with an additional catch since the wind caused by the speed of the car will tend to close instead of open the hood if the lock has carelessly been left released. Reversing the action of the toggle link will automatically lock the hood securely in the down position.



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## 1940 to be Big Year for Tractor Sales

A number of outstanding authorities on the rural market predict that tractor sales will boom in 1940. There are two reasons for this expected increase in tractor sales:

1. During the past year, several low-priced tractors have been introduced by leading manufacturers. These low priced units make it possible for a great many farmers to own tractors, who in the past were unable to afford them.

2. The 1940 farm income is expected to surpass any during the past ten years.

Consequently, with an increase in farm income and the introduction of new low-priced tractors, it is anticipated that thousands of farmers who have never before used tractors, will buy them in 1940.

When one stops to realize that the average tractor consumes annually

1400 gal. of Tractor Fuel  
40 gal. of Motor Oil  
140 lb. of Gear Lubricants  
20 lb. of Specialized Lubricants

it can readily be seen that these new tractors will create a tremendous additional demand for petroleum products.

With these facts in mind, every oil man who wants to increase his sales in 1940 should be interested in the new CHEK-CHART Tractor Lubrication Program.

## New Film on Tractor Fuel Available

A new, interesting and educational sound slide film on Tractor Fuels has just been produced by the Ethyl Gasoline Corporation. The title of this film is "John Ross Gets the Facts," and it tells a very impressive story on how farmers can increase the power of their tractors by using good fuel.

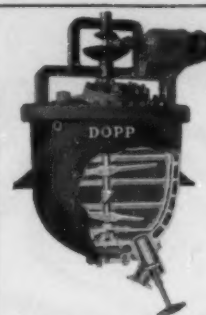
Copies of this new film are available through the Ethyl Gasoline Corporation, and we recommend that all oil marketing executives see this film before planning their Rural Market Sales Program for the spring.

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